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Educational interventions to improve student readiness

Abstract

Many first-year students are seen to struggle to build resilience in their first year of post-secondary education. The journey of the first year or incoming university students is explained with an analogy of racing cars mainly an analogy for student learning based on the performance of race cars. To improve retention and first year experience, higher education institutes try to build resilience in students, they expect students to participate in campus activities and interact with other students and teachers from different backgrounds. But what about students' expectations of their institution and how often institutions emphasize these training and engagement opportunities to their incoming students? An online student readiness intervention program has been designed to understand expectations and investigate predictors that promote resilience. The student readiness resilience intervention program includes three phases, which begin with a diagnostic assessment to determine individuals acquired knowledge and skills. The next phase helps prepare students by addressing the learning gaps from the results of the online tests through virtual events. The final phase includes personalized learning with mentors' mobile coaching with an aim to build resilience by creating lasting habits and capabilities to enable first year students to remain calm and focused. This study further reviews various theories to identify process, trends, differences, and gaps to describe and critically analyse student readiness and effects of intervention programs. It will also provide useful critique and recommendations to transition leaders and educators in relation to the student resilience.

Introduction

University life is undeniably exciting, but it can also be overwhelming particularly for freshmen struggling to get used to being on their own in a completely new learning environment early in their academic year. The path of each student is unique. As they start to embrace the experiences, they discover about themselves, their interests, strengths, and weaknesses. The first year of university is crucial and an area of concern for the education stakeholders especially when dealing with the underprepared freshman who pose an early risk of dropping out (Cholewa & Ramaswami, 2015). The impact of pre-entry interventions have been claimed by studies in the literature to positively influence student readiness and success. To address and arrest the situation, a growing list of bridging tools, interventions, and transitional programs have been seen worldwide. These include summer bridge program designed by the University of Michigan to assist advisors with information about student engagement and performance to provide timely interventions to at-risk students (Lonn et al., 2015). Additionally, to bridge numeracy gaps the University of the South Pacific designed an Online Mathematics Diagnostic Tool (OMDT) for its freshman to address the varying levels of mathematical knowledge brought by its student diversity (sharma et al., 2019). Such pre-entry programs offer a strong start to help prepare students in navigating a multitude of opportunities to connect with others, develop skills, get organized, and provides countless ways to acclimatize and thrive in the first year of university life. These pre-entry intervention works are administered before a student embarks on his or her academic journey while other adaptive interventions are either restricted to the end of semester or academic year or institutionalized during the semester and run in parallel with the scheduled courses.

The latter category includes grade retention (Anderson et al., 2002), flexible and online learning (Jokhan & Sharma, 2010; Derezinski, 2014; Wallace, 2003; Hughes, 2007), early warning systems (Jokhan et al., 2019), eMentoring (Thompson, 2010; Rowland, 2012; Tisdell, 2019), peer mentoring (Budny et al., 2010; Collings, 2014; Lim, 2017), at risk interventions (Angela et al., 2013), and more recently the study buddy systems (Morss, 2001; Madland, 2016). However, evidences and studies from the literature have shown that without the pre-entry and bridging interventions the students do not attain promising results and some will eventually fail.

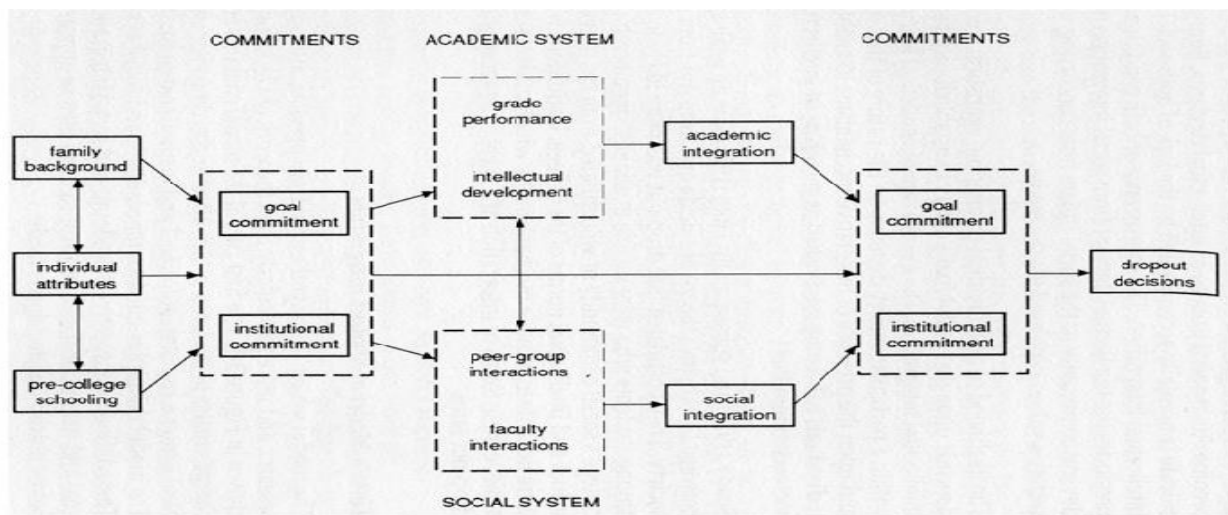
Factors affecting the student transition and retention rates at higher education institutions have been subject to numerous ongoing research studies. Some of the problems and challenges in the transition we see with our first-year students are that they do not have relevant information about the tertiary institution, information on entry and programme requirements, relevant numeracy and literacy skills, ICT competencies, social integration thus lack self-confidence, and positive self-compassion and proactivity. Silver, Saunders and Zarate in 2008 stressed that high school factors demonstrate academic experiences and are associated with student successful and unsuccessful persistence due to lack of resources that can play a huge role if not addressed early by the Higher education institutes (HEI). In addition, most HEI fail to identify the curriculum gaps hence fail to factor them in their early intervention programs (Sharma et al., 2015).

All the above clearly show that the students are at-risk even before they join HEI and are set to fail in their programmes right from the start. Overall, transition from high schools to HEI is an indispensable ongoing process where levels of support must be adjusted accordingly (Jindal-Snape, 2010).

As Latham and Green (1997) stated, the student in transition must contend with, adapt to, and learn about many differences and diversity. Consequently, student needs to at least have a fair idea in mind or some knowledge about the culture of the new setting to feel comfortable with their decision and be focused (Hill et al., 2018). Furthermore, proactive coping strategies of students play an important role in adjustment to new learning environments (Gan et al., 2010). Conversely, the problem is also addressed to a certain degree if institutional orientation programs are in itself proactive and focussed on meeting the needs of incoming student. All in all if we are able to fix the aforementioned problems and overcome barriers to integration in advance, there is a strong possibility of successful transition and improved student chances of success.

Literature Review and Conceptual Framework

To describe the complex process of student integration, Tinto (1993) applies Van Genneps (1960) theory about rites of passage and its three stages; separation, transition, and incorporation. According to the theory, the first stage of tertiary students experience is separation. It requires students to disassociate themselves physically and socially from their previous communities such as high school friends, family, and place of residence. These previous communities often have different values, norms and behavioral styles when compared to those of the HEI (Tinto, 1993). The second stage of the student experience is transition. It comes either during or after the separation stage. It is the stage where students find themselves separated from their previous communities but have not fully adapted to the HEI community. Many students voluntarily withdraw from HEI during this stage because they cannot cope with new patterns of behavior and they are likely to experience confusion and uncertainty. However, a student’s goal and institutional commitment play an important role in this stage (Tinto, 1988). To Tinto this process is necessary for the student to be adequately equipped socially and academically engaged. The last stage is incorporation, which can only happen if the students have passed through the stages of separation and transition. During this stage, students are expected to become fully integrated/incorporated into the HEI community. However, having moved away from the past behavioral patterns of the past associations, individuals now face problems in adapting to the new changes. We have adopted Tinto’s theory for the current study due to the relevance and connected of its stages to the proposed racing car analogy.



Source: Tinto, 1975

Research questions

The authors hypothesize that the following fundamental questions remain unattended and hence are posted in order to accomplish the goals of the current study:

1. Are the aforementioned and similar practices and strategies sufficient to entirely support the first-year students?

2. Do the institutions nurturing system extends before and after the students academic journey?
3. Is readiness for higher education addressed sufficiently in student retention model?
4. What factors and student characteristics contribute to effectively prepare student in the first year at university?
5. What level of readiness do first year students demonstrate upon entering from the perspectives of responsibilities, academic and non-academic knowledge, and abilities?

Methodology

The research methodology for this study is quantitative, whereby the research design follows a survey methodology. An online survey was conducted using Moodle platform to determine readiness of students in the Pacific towards the higher education measure student readiness of the chosen success factors. A total of 631 students completed the survey.

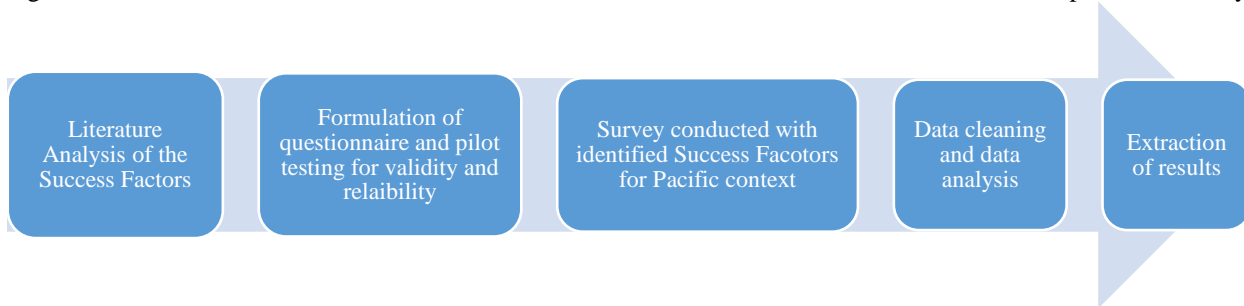


Figure 1: Process adopted to conduct the study.

Survey Instrument

A five-point Likert scale questionnaire was designed which contained 55 questions related to student readiness to HE which were divided into seven (7) factors:

- i. Success Factor 1: **Student Attitude and Perception** – 10 variables,
- ii. Success Factor 2: **Social Responsibility** - 5 variables,
- iii. Success Factor 3: **Digital Competencies** – 5 variables and
- iv. Success Factor 4: **Numeracy and Literacy** – 7 variables
- v. Success Factor 5: **Student Learning Behavior-Proactivity** – 10 variables
- vi. Success Factor 6: **Resources and Support** – 8 variables
- vii. Success Factor 7: **Social Involvement and Development** – 10 variables

In this study, Cronbach's alpha for internal consistency among the fifty five items of the seven success factors was 0.91, the value was calculated using the SPSS software. The Cronbach alpha value for the test was 0.909 as shown in *Table 1*.

Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	Number of Items
.909	.909	150

Table 1: Reliability statistics.

Significance of the Current Study

This study has considered the role of the pre-entry intervention program and to what extent its attributes influence student outcome or are associated with student achievement. In consideration of these questions, we see the emergence

of a gap in the nourishing and nurturing system. There is a dearth of tools and programs for students who are yet to begin their journeys in HE. Notwithstanding, pockets of nurturing have sprout sparsely in this potentially new category of interventions. However, to unveil the complexities, the authors believe that an analogy of racing cars will be most appropriate. Akin to the incoming first year students, the racing cars embark on a journey, racing against other cars to the finishing line. Let us consider the start of the race where all the racing cars are lined up at the starting line and ready to begin their ambitious journey, a race to the end. The common objective is to finish the race, but some also aspire for the ranking and the prizes.

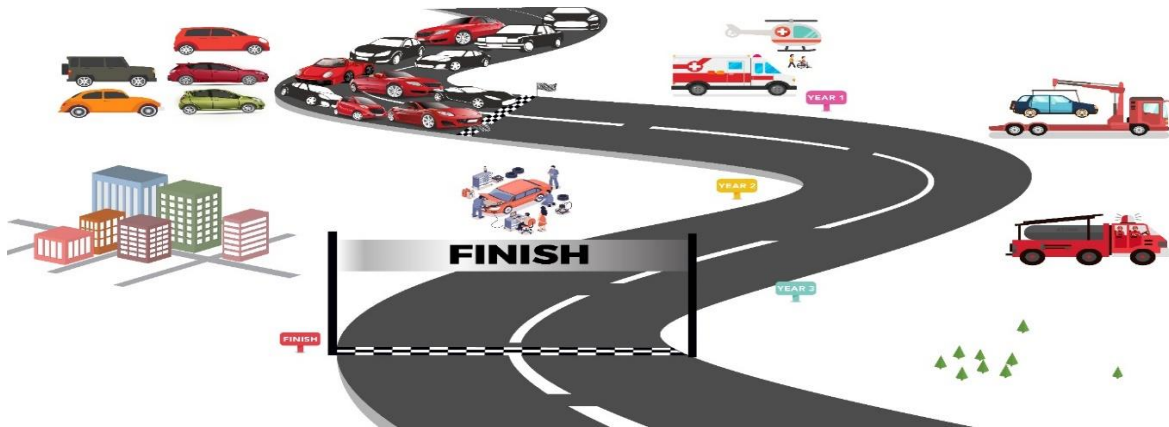


Figure 2: A schematic snapshot of a racing car line up on the track to finishing line

Figure 2 provides a schematic representation of this viewpoint, which also captures the attention of the concerned bystanders, including the judges, sponsors, media, technical/engineering team and even the armchair racers. The race begins when the flag is waved or a race-gun fired.

Now let us compare this to a student's entry into a higher education programme and its completion in the mandatory period of time. The authors are heavily inclined to diagnose the same categories for the freshmen. While the racing cars take-off in the race from the starting line, the freshmen also take-off in their prescribed programmes from the beginning of semester or academic year barring any setbacks. The two systems are operating with the same parameters and ideologies, and the ownership, commitment and diligence from participants for the sake of achieving their goals. Let us diagnose and interpret these categories carefully.

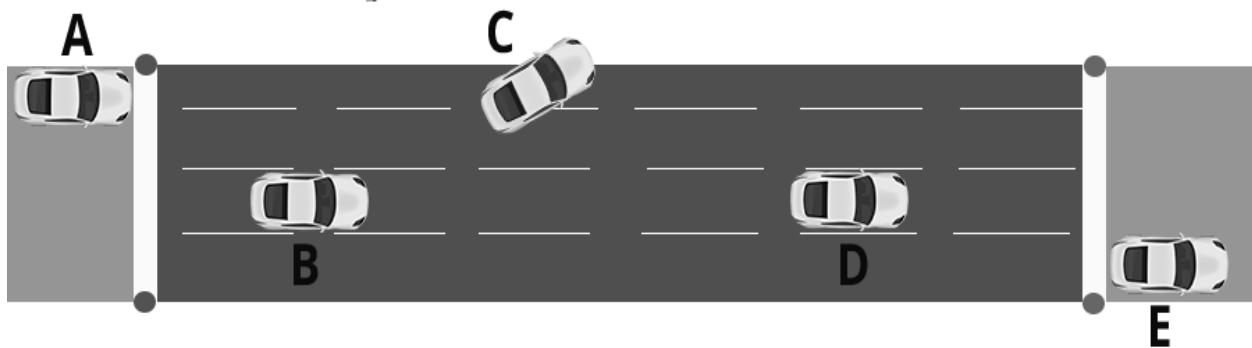


Figure 3: A second snapshot of the race and the positions of the cars with a view from the balcony.

The path of each student is unique. The best racers are vigorously focused on preparation to withstand the challenges of a race or be it tertiary life. The current study explains and considers racing car analogy to give a comparison view of racers journey with freshman (first-year students).

Category A - cars do not take-off at all

A car develops problem(s) at the starting line. Here we question the readiness of the racing car. A car that entered the race but did not attend (DNA) or “no-show”, because a race car is faced with the decision of whether to race after signing up. Freshmen do not start their academic journey in the institution after admission because some are still understanding and considering on workable decision such as budgeting, understanding modes of delivery mainly part-time student due to lack of information. In light of the analogy, we can also group these freshmen in three different categories; (1) students who are admitted to the university but do not enroll in courses, (2) students who do not qualify into their choice of programme for not meeting the required high school marks and/or sponsors designated list or programmes, (3) finally those who maybe deciding to join another university because of the scholarship.

Category B - cars do not take-off well and do not complete the race

A race car develops system problem and is most likely to cause performance issues as the race begins. Although there are many issues, among these issues is learner readiness. In this we may end up with two categories; (1) we question the readiness of the students. Considering the new learning environment first year students struggle to get the desirable take-off because they are not adequately equipped or have enough ammunition to start their HE journey, and (2) students awareness and completion of the readiness program. There is a sincere lack of effort by institutions in making students and family aware of the readiness program and most importantly its availability. The readiness program and trainings are mostly conducted during enrollment and registration week which is often a busy time. The student’s focus is adversely affected due to the information overload and hence many ignore the training opportunities even though they are well aware of their advantages and usefulness.

Category C - cars get derailed

A car develops problem(s) within the race. Freshmen that did not start well, can easily get derailed and abscond their programmes. In this category there can be many students who are not ready for the HE studies due to the larger influence of modern educational technology, poor health, emotional instability or social anxiety, family problems, lack of motivation and self-confidence, time management issues. Some students also get into financial problems if they are spending too much.

Category D - cars do not reach the finishing line in time or take longer to complete the race

A race car takes longer to completes the race. In light of the analogy, we have students who are at-risk of failing their courses some who resort to summer-schools in the semester breaks, re-sitting of examinations, and overloading during the semester. These timely remediations such as at-risk intervention program, personalized mentoring(both f2f and tele-mentoring) helps get back on track and succeed in completing their courses, although taking more time than the normal duration of programmes.

Category E - cars complete the race in the accepted period of time.

And cars that complete the race within the acceptable time without any stoppages or cautions. The ultimate machine at least for the particular race. The great engineering/technical team is also needed to help the driver stay on track, understand how to harness and find success or achieve results. If summarised, one example is engine, part of a race car that is evolved and operated by a team of people and this race car team is part of the overall racing which is university learning efforts. These university efforts are in form of student readiness programs (educational interventions) that helps a race car along the way from all worries and distractions.

Results and Discussion

The seven factors (i.e., Student Attitude and Perception (AP), Social Responsibility (SR), Digital Competencies (DC), Numeracy and Literacy (NL), Student Learning Behavior-Proactivity (BP), Resources and Support (RS) and Social Involvement and Development (SI)) were used to determine the pattern and examine the readiness level between factors in the 55 items.

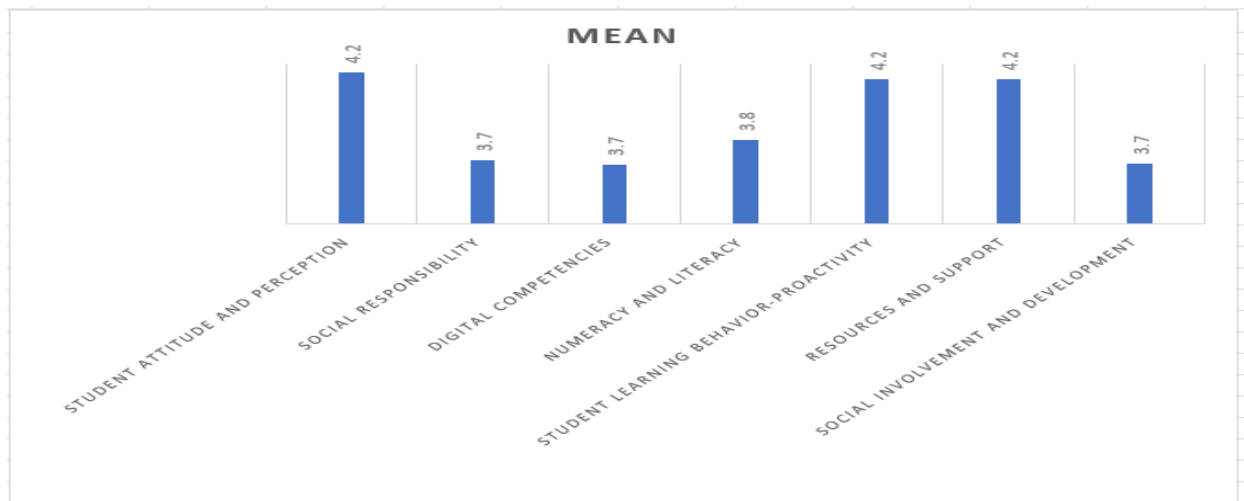


Figure 4: Mean scores for all success factors.

The results of descriptive analysis indicated that new students had a high level of attitude and perception competencies (M=4.246), Student Learning Behavior-Proactivity (M=4.204) and Resources and Support (M=4.204) whereas they felt a relatively low level of digital (M=3.669), Numeracy and Literacy (M=3.821), Social Responsibility (3.700) and Social Involvement and Development (M=3.674). Findings also show that digital competencies mean for the item “I am not able to use mobile devices for learning” (M=2.243) and social involvement and development competence mean for the item “I am not comfortable making new friends” (M=2.865) were the lowest. That is why first year university students face difficulty to get along with peers and stay motivated and engaged among peers using digital platforms.

While the paper carefully elucidates the journey of the incoming university students with an analogy of racing cars, the two different sets of support is provided. The first category of the tools and services is well documented and is also very successful; however, one cannot deny the growing importance of the second category. This paper provides supporting evidence from the data collected from the in-house tailored programmes at the University of the South Pacific.

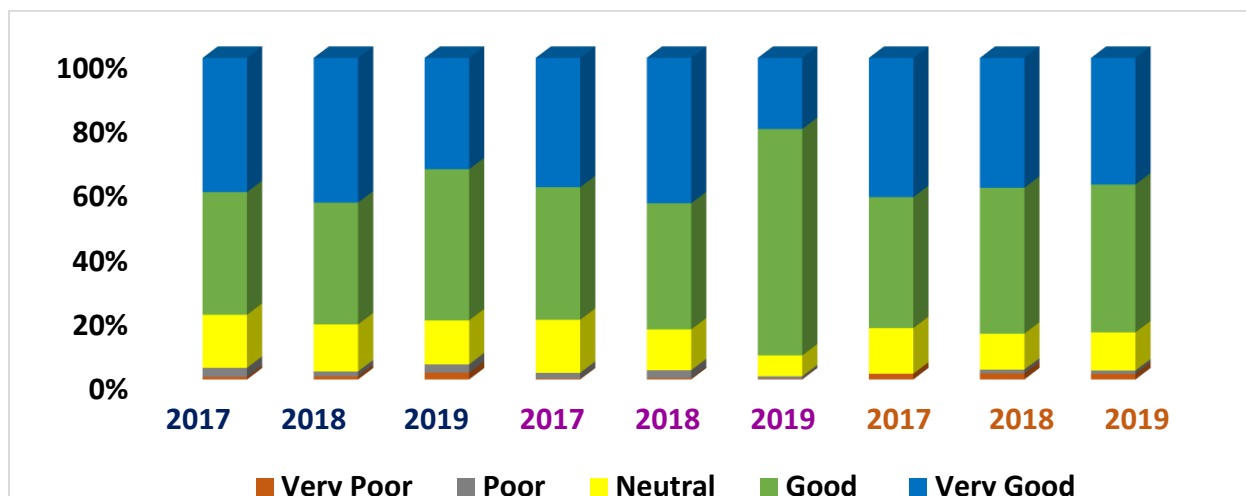
Table 2 shows the student performance sorted at country level from 2014 to 2017. Comparatively some campuses are performing at lower levels than the rest. Research has shown that a number of these countries do not have the face-to-face Year 13 level studies in a number of schools and hence have to resort to print based distance education which greatly affects their performances in that level and subsequently in the first-year university studies. Adding to that we have a lack of qualified teachers who teach mathematics in senior secondary schools (sharma et al., 2018). Consequently, students are deprived of good mathematics and sometimes certain mathematics concepts are compromised. All the above clearly show that the students are at-risk even before they join the university, and hence are set to fail in their programmes right from the start. It shows the need for early intervention programmes before the beginning of the academic journey.

Attainment	Alafua	Cook Islands	Kiribati	Labasa	Laucala	Lautoka	Marshall Is	Solomon Is	Tokelau	Tonga	Tuvalu	Vanuatu
Distinction 78+	0	0	0	1	25	2	0	4	0	1	0	3
Credit 64-77	1	0	1	5	99	10	0	22	0	2	0	7
Pass 50-63	2	0	3	12	165	15	0	49	1	5	2	15
Participation 0-49	5	1	13	19	284	17	2	129	4	20	6	45
Average	42.5	37.5	32.2	46.79	47.75	51.3	17.5	40.8	44.5	39.4	37.8	41.25

Table 2: The percentage pass rates in OMDT for the students from different countries from 2014 to 2017.

The Faculty Online Orientation Tool (FOOT) is a virtual orientation package to guide the new students to the university learning environment and programme expectations. Figure 5 shows the data from the feedback questionnaire, where 80% or more students rated the tool as “Good and Very Good” in terms of their overall satisfaction, recommendation to their peers and the contents of FOOT from 2017 to 2019 which indicates the perceived effectiveness of the tool by the students (Kumar, B. et al., 2019). Again the overall feedback from multiple years point in the direction of a need for tools to furnish students with relevant information before their academic journey in HEI.

Figure 5: Showing the student feedback data from the FOOT for years 2017 to 2019



Source: Kumar, B. et al. (2019)

The specially designed face to face Preparation for Higher Education Workshop (PHEW!) was administered during the student orientation into the In-country Science Programme, a platform to upgrade the qualifications of underqualified science teachers outside of its main campus (sharma et al., 2019). The workshop was successful with the feedback in Table 2 showing averages from a 5-point Likert scale [strongly disagree (1), disagree (2), neutral (3), agree (4), strongly agree (5)] on the level of student satisfaction with the workshop. The high average feedback shows that students found the takeaways of the workshop useful for their programme and found themselves to be better prepared to commence the programme.

Table 3: showing student feedback data from PHEW!

Cohort	Level of the student satisfaction
Science Teachers Accelerated Programme Samoa Cohort I, June 2014	$\bar{x} = 4.79$; $sd = 0.45$
Science Teachers Accelerated Programme Samoa Cohort II, January 2017	$\bar{x} = 4.71$; $sd = 0.54$

Tonga In-country Science Programme Cohort, January 2017	$\bar{x} = 4.79$; $sd = 0.52$
Vanuatu In-country Science Programme, June 2018	$\bar{x} = 4.72$; $sd = 0.58$

Source: Sharma et al., 2019

Refresher and Induction Programme (RIP) was designed to give students the best possible start by equipping them with tools for a smoother transition to tertiary level. Table 3 shows that most students were satisfied with the overall programme. The workshop was well designed with relevant information indeed helpful to first year students at USP. The main goals for the RIP sessions were to prepare students for their first year at USP. Figure 2 shows that majority of the students choose 5 on the Likert scale which corresponds to *Strongly Agree*.

Table 4: showing student feedback data from RIP

Responses	1	2	3	4	5	Total
The modules helped me to understand the services better.	25 (15%)	3 (2%)	18 (11%)	29 (18%)	90 (55%)	165
The modules were well designed with relevant content.	17 (10%)	14 (8%)	21 (13%)	30 (18%)	83 (50%)	165
The modules helped me understand what is expected from me in my courses.	26 (16%)	3 (2%)	18 (11%)	35 (21%)	83 (50%)	165
I would have a better start at USP after attending RIP.	21 (13%)	9 (5%)	14 (8%)	28 (17%)	93 (56%)	165
I would advise my friends to attend RIP.	24 (15%)	7 (4%)	13 (8%)	10 (6%)	111 (67%)	165

Early Experience online Survey was conducted in semester 1, 2020 to see the effectiveness of the support tools and services. Table 4 shows that majority of students find the services helpful. It was also noted that many were not sure or maybe were not aware of the of the immense amount of support available both face to face and online on different platforms.

Table 5: showing student feedback data from Early Experience online Survey

Responses	Not Sure	Not at all Helpful	Slightly Helpful	Neutral	Helpful	Extremely Helpful	Not Applicable	Total
Extra support from teaching team (Special remedial session)	26 (7%)	1 (0%)	12 (3%)	65 (17%)	172 (46%)	84 (23%)	16 (4%)	376
Faculty Orientation Online Tool (FOOT)	24 (6%)	4 (1%)	23 (6%)	77 (20%)	160 (44%)	77 (20%)	11 (3%)	376

Online Mathematics Diagnostic Tool (OMDT)	22 (6%)	7 (2%)	24 (6%)	79 (21%)	128 (34%)	97 (26%)	19 (5%)	376
USP mobile apps/ USP maps	12 (3%)	8 (2%)	25 (7%)	66 (18%)	122 (32%)	124 (33%)	19 (5%)	376
eMentoring	31 (8%)	3 (1%)	13 (4%)	77 (20%)	122 (32%)	109 (29%)	21 (6%)	376
Peer Assisted Study Session (PASS)	26 (7%)	2 (0%)	12 (3%)	62 (17%)	124 (33%)	131 (35%)	19 (5%)	376
Student Learning Specialist staff	27 (7%)	2 (0%)	15 (4%)	67 (18%)	139 (37%)	110 (29%)	16 (5%)	376

Conclusion

It was seen that higher education plays an important role by building resilience and make first year students feel empowered to deal with ongoing challenges of university life. However, concern was raised that university practices are not preparing the students sufficiently. Studies conducted across the world on various aspects of preparing students for Higher Education studies showed that institutes in the Pacific faced the similar challenges. For each success factors mean was calculated and the results show that digital, numeracy, literacy and social competencies such as student motivation, involvement and engagement were important to be successful in both face-to-face and online higher education learning. While many are actively addressing the case where the students face problems during the course, higher education providers also fail to realise and address the problems permeating at the take-off. Thus, there has to be an intelligent system which appropriately weighs and considers both the academic and non-academic factors and parameters such as low social integration, lack self-confidence, self-compassion, self-motivation, low literacy, numeracy and ICT competencies.

The way forward is for the relevant stakeholders to use the recommendations coming out from the current study and develop with other partners an intelligent pre-university system that can empower students with relevant skills and knowledge required to have a successful academic journey. This pre-university support system will nurture and upskill students to overcome challenges of their new academic journey and enable them to reach their maximum potential. Enable students to acquire essential knowledge and skills for success in postsecondary education with targeted and personalized interventions so that they achieve their academic goals.

This research is a part of a Masters of Arts programme which has set the stage for further work through a comprehensive analytics of the survey results and correlation with student performances to determine which readiness attributes are most influential for student success in their academic journeys. Hence more targeted interventions can be designed mostly at pre-university level.

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